Amendments to the Claims

The following listing of claims will replace all prior versions, and listings, of claims in the present application:

1. (Currently Amended) A method of reducing an amount of carbon monoxide in process fuel gas in a water gas shift converter, comprising:

placing a high activity water gas shift catalyst system into a water gas shift converter, the high activity water gas shift catalyst system consisting essentially of a noble metal; a support consisting essentially of cerium oxide, or a mixed metal oxide of cerium oxide-zirconium oxide wherein cerium oxide is present in an amount ranging from about 80% to about 20% by weight of total metal oxide and wherein zirconium oxide is present in an amount ranging from about 20% to about 80% by weight of total metal oxide, or a mixed metal oxide of cerium oxide-lanthanum oxide wherein cerium oxide is present in an amount ranging from about 80% to about 20% by weight of total metal oxide and wherein lanthanum oxide is present in an amount ranging from about 20% to about 80% by weight of total metal oxide; an anti-methanation agent consisting essentially of copper, or manganese, or iron, or combinations thereof; and ~~optionally~~ a promoter comprising alkali metals or alkaline earth metals or combinations thereof; and

passing the process fuel gas through the water gas shift converter in effective contact with the high activity water gas shift catalyst system and converting a portion of the carbon monoxide in the process fuel gas into carbon dioxide and hydrogen by a water gas shift reaction with no methane formation at a temperature in a range of about 200°C to about 350°C.

2. (Previously Presented) The method of claim 1 wherein the anti-methanation agent comprises copper in an amount ranging from about 0.1% to about 10% by total weight of catalyst.

3. (Withdrawn) The method of claim 1 wherein the anti-methanation agent comprises a manganese compound in an amount ranging from about 0.1% to about 5% by total weight of catalyst.

4. (Withdrawn) The method of claim 1 wherein the anti-methanation agent comprises an iron compound in an amount ranging from about 0.1% to about 5% by total weight of catalyst.

5. (Currently Amended) The method of claim 1 wherein the noble metal is ~~selected from~~ platinum, palladium, ruthenium, iridium, or mixtures thereof.

6. (Original) The method of claim 1 wherein the noble metal is present in an amount ranging from about 1% to about 4% by weight of total catalyst.

7. (Previously Presented) The method of claim 1 wherein the promoter is cesium, lithium, rubidium, potassium, magnesium, strontium, barium, or combinations thereof.

8. (Original) The method of claim 1 wherein the promoter is present in an amount of between about 0.1% and about 1% by weight of total catalyst.

9. (Original) The method of claim 1 wherein there is no methane formation at a temperature in a range of about 200°C to about 425°C.

10. (Original) The method of claim 1 wherein there is no methane formation at a temperature in a range of about 200°C to about 500°C.

11. (Original) The method of claim 1 wherein there is no methane formation at a temperature in a range of about 200°C to about 600°C.

12. (Original) The method of claim 1 wherein passing the process fuel gas through the water gas shift converter is performed at a temperature in the range of about 200°C to about 475°C.

13. (Original) The method of claim 1 wherein passing the process fuel gas through the water gas shift converter is performed at a temperature in the range of about 250°C to about 425°C.

14. (Previously Presented) A method of reducing an amount of carbon monoxide in process fuel gas in a water gas shift converter, comprising:

placing a high activity water gas shift catalyst system into a water gas shift converter, the high activity water gas shift catalyst system consisting essentially of a noble metal; a support consisting essentially of cerium oxide, or a mixed metal oxide of cerium oxide-zirconium oxide wherein cerium oxide is present in an amount ranging from about 80% to about 20% by weight of total metal oxide and wherein zirconium oxide is present in an amount ranging from about 20% to about 80% by weight of total metal oxide, or a mixed metal oxide of cerium oxide-lanthanum oxide wherein cerium oxide is present in an amount ranging from about 80% to about 20% by weight of total metal oxide and wherein lanthanum oxide is present in an amount ranging from about 20% to about 80% by weight of total metal oxide; an anti-methanation agent consisting essentially of copper present in an amount ranging from about 0.1% to about 10% by total weight of catalyst, or manganese present in an amount ranging from about 0.1% to about 5% by total weight of catalyst, or iron in an amount ranging from about 0.1% to about 5% by total weight of catalyst, or combinations thereof; and a promoter comprising alkali metals or alkaline earth metals or combinations thereof, the promoter present in an amount ranging from about 0.1% to about 1% by weight of total catalyst; and

passing the process fuel gas through the water gas shift converter in effective contact with the high activity water gas shift catalyst system and converting a portion of the carbon monoxide in the process fuel gas into carbon dioxide and hydrogen by a water gas shift reaction with no methane formation at a temperature in a range of about 200°C to about 350°C.

15. (Currently Amended) A high activity water gas shift catalyst system consisting essentially of:

a noble metal;

a support consisting essentially of cerium oxide, or a mixed metal oxide of cerium oxide-zirconium oxide wherein cerium oxide is present in an amount ranging from about 80% to about 20% by weight of total metal oxide and wherein zirconium oxide is present in an amount ranging from about 20% to about 80% by weight of total metal oxide, or a mixed metal oxide of cerium oxide-lanthanum oxide wherein cerium oxide is present in an amount ranging from about 80% to

about 20% by weight of total metal oxide and wherein lanthanum oxide is present in an amount ranging from about 20% to about 80% by weight of total metal oxide;

an anti-methanation agent consisting essentially of copper, or manganese, or iron, or combinations thereof; and

~~optionally~~ a promoter comprising alkali metals or alkaline earth metals or combinations thereof,

wherein the high activity water gas shift catalyst system has no methane formation at a temperature in a range of about 200°C to about 350°C.

16. (Withdrawn) The high activity water gas shift catalyst system of claim 15 wherein the anti-methanation agent comprises a copper compound in an amount ranging from about 0.1% to about 10% by total weight of catalyst.

17. (Withdrawn) The high activity water gas shift catalyst system of claim 15 wherein the anti-methanation agent comprises a manganese compound in an amount ranging from about 0.1% to about 5% by total weight of catalyst.

18. (Withdrawn) The high activity water gas shift catalyst system of claim 15 wherein the anti-methanation agent comprises an iron compound in an amount ranging from about 0.1% to about 5% by total weight of catalyst.

19. (Withdrawn) The high activity water gas shift catalyst system of claim 15 wherein the noble metal is selected from platinum, palladium, ruthenium, iridium, or mixtures thereof.

20. (Withdrawn) The high activity water gas shift catalyst system of claim 19 wherein the noble metal is present in an amount ranging from about 1% to about 4% by weight of total catalyst.

21. (Withdrawn) The high activity water gas shift catalyst system of claim 15 wherein the promoter is selected from cesium, lithium, rubidium, potassium, magnesium, strontium, barium,

or combinations thereof.

22. (Withdrawn) The high activity water gas shift catalyst system of claim 15 wherein the promoter is present in an amount of between about 0.1% and about 1% by weight of total catalyst.

23. (Withdrawn) The high activity water gas shift catalyst system of claim 15 wherein there is no methane formation at a temperature in a range of about 200°C to about 425°C.

24. (Withdrawn) The high activity water gas shift catalyst system of claim 15 wherein there is no methane formation at a temperature in a range of about 200°C to about 500°C.

25. (Withdrawn) The high activity water gas shift catalyst system of claim 15 wherein the high activity water gas shift catalyst system has no methane formation at a temperature in a range of about 200°C to about 600°C.

26-44. (Canceled).

45. (Currently Amended) A method of reducing an amount of carbon monoxide in process fuel gas in a water gas shift converter, comprising:

placing a high activity water gas shift catalyst system into a water gas shift converter, the high activity water gas shift catalyst system comprising a noble metal; a support consisting essentially of cerium oxide, or a mixed metal oxide of cerium oxide-zirconium oxide wherein cerium oxide is present in an amount ranging from about 80% to about 20% by weight of total metal oxide and wherein zirconium oxide is present in an amount ranging from about 20% to about 80% by weight of total metal oxide, or a mixed metal oxide of cerium oxide-lanthanum oxide wherein cerium oxide is present in an amount ranging from about 80% to about 20% by weight of total metal oxide and wherein lanthanum oxide is present in an amount ranging from about 20% to about 80% by weight of total metal oxide; an anti-methanation agent comprising copper; and ~~optionally~~ a promoter comprising alkali metals or alkaline earth metals or combinations thereof; and

passing the process fuel gas through the water gas shift converter in effective contact with the high activity water gas shift catalyst system and converting a portion of the carbon monoxide in the process fuel gas into carbon dioxide and hydrogen by a water gas shift reaction with no methane formation at a temperature in a range of about 200°C to about 350°C.

46. (Previously Presented) The method of claim 45 wherein the copper is present in an amount ranging from about 0.1% to about 10% by total weight of catalyst.

47. (Previously Presented) The method of claim 45 wherein the noble metal is platinum, palladium, ruthenium, iridium, or mixtures thereof.

48. (Previously Presented) The method of claim 45 wherein the noble metal is present in an amount ranging from about 1% to about 4% by weight of total catalyst.

49. (Previously Presented) The method of claim 45 wherein the promoter is cesium, lithium, rubidium, potassium, magnesium, strontium, barium, or combinations thereof.

50. (Previously Presented) The method of claim 45 wherein the promoter is present in an amount of between about 0.1% and about 1% by weight of total catalyst.

51. (Previously Presented) The method of claim 45 wherein there is no methane formation at a temperature in a range of about 200°C to about 425°C.

52. (Previously Presented) The method of claim 45 wherein there is no methane formation at a temperature in a range of about 200°C to about 500°C.

53. (Previously Presented) The method of claim 45 wherein there is no methane formation at a temperature in a range of about 200°C to about 600°C.

54. (Previously Presented) The method of claim 45 wherein passing the process fuel gas through the water gas shift converter is performed at a temperature in the range of about 200°C to about 475°C.

55. (Currently Amended) A high activity water gas shift catalyst system comprising:

a noble metal;

a support consisting essentially of cerium oxide, or a mixed metal oxide of cerium oxide-zirconium oxide wherein cerium oxide is present in an amount ranging from about 80% to about 20% by weight of total metal oxide and wherein zirconium oxide is present in an amount ranging from about 20% to about 80% by weight of total metal oxide, or a mixed metal oxide of cerium oxide-lanthanum oxide wherein cerium oxide is present in an amount ranging from about 80% to about 20% by weight of total metal oxide and wherein lanthanum oxide is present in an amount ranging from about 20% to about 80% by weight of total metal oxide;

an anti-methanation agent comprising copper; and

~~optionally~~ a promoter comprising alkali metals or alkaline earth metals or combinations thereof,

wherein the high activity water gas shift catalyst system has no methane formation at a temperature in a range of about 200°C to about 350°C.

56. (Previously Presented) The high activity water gas shift catalyst system of claim 55 wherein the copper is present in an amount ranging from about 0.1% to about 10% by total weight of catalyst.

57. (Previously Presented) The high activity water gas shift catalyst system of claim 55 wherein the noble metal is platinum, palladium, ruthenium, iridium, or mixtures thereof.

58. (Previously Presented) The high activity water gas shift catalyst system of claim 55 wherein the noble metal is present in an amount ranging from about 1% to about 4% by weight of total catalyst.

59. (Previously Presented) The high activity water gas shift catalyst system of claim 55 wherein the promoter is cesium, lithium, rubidium, potassium, magnesium, strontium, barium, or combinations thereof.

60. (Previously Presented) The high activity water gas shift catalyst system of claim 55 wherein the promoter is present in an amount of between about 0.1% and about 1% by weight of total catalyst.

61. (Previously Presented) The high activity water gas shift catalyst system of claim 55 wherein there is no methane formation at a temperature in a range of about 200°C to about 425°C.

62. (Previously Presented) The high activity water gas shift catalyst system of claim 55 wherein there is no methane formation at a temperature in a range of about 200°C to about 500°C.

63. (Previously Presented) The high activity water gas shift catalyst system of claim 55 wherein the high activity water gas shift catalyst system has no methane formation at a temperature in a range of about 200°C to about 600°C.